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ABSTRACT

The present invention relates to a doped semiconductor nanocrystal layer comprising (a) a group IV oxide layer which is free of ion implantation damage, (b) from 30 to 50 atomic percent of a semiconductor nanocrystal distributed in the group IV oxide layer, and (c) from 0.5 to 15 atomic percent of one or more rare earth element, the one or more rare earth element being (i) dispersed on the surface of the semiconductor nanocrystal and (ii) distributed substantially equally through the thickness of the group IV oxide layer. The present invention also relates to a semiconductor structure comprising the above semiconductor nanocrystal layer and to processes for preparing the semiconductor nanocrystal layer.